

Appendix E2

Current Worker Scenario

TABLES

E2-1.	Total risks by exposure pathway at each site/area for the current worker scenario.....	E2-1
E2-2.	Total risks by exposure pathway and group for the current worker scenario.....	E2-2
E2-3.	Total risk at each site/group for the current worker scenario.....	E2-3
E2-4.	Risk by ingestion of soil, carcinogens for the current worker scenario.....	E2-4
E2-5.	Risk by inhalation of fugitive dust, carcinogens for the current worker scenario.....	E2-7
E2-6.	Risk by inhalation of volatiles from soil, carcinogens for the current worker scenario.....	E2-8
E2-7.	Risk by external radiation exposure, carcinogens for the current worker scenario.....	E2-9
E2-8.	Risk by dermal absorption of soil, carcinogens for the current worker scenario.....	E2-10
E2-9.	Total hazard quotients by exposure pathway at each site/area for the current worker scenario.....	E2-13
E2-10.	Total hazard quotients by exposure pathway and group for the current worker scenario.....	E2-14
E2-11.	Total hazard quotients at each site/group for the current worker scenario.....	E2-15
E2-12.	Hazard quotients by ingestion of soil for the current worker scenario.....	E2-16
E2-13.	Hazard quotients by inhalation of fugitive dust, non-carcinogens for the current worker scenario.....	E2-19
E2-14.	Hazard quotients by inhalation of volatiles from soil, non-carcinogens for the current worker scenario.....	E2-20
E2-15.	Hazard quotients by dermal absorption of soil, non-carcinogens for the current worker scenario.....	E2-21
E2-18.	Intake, ingestion of surface soil (0–6 in.), carcinogen (mg/kg-day or pCi/kg-day) for the current worker scenario.....	E2-24
E2-19.	Intake, ingestion of surface soil (0–6 in.), noncarcinogen (mg/kg-day) for the current worker scenario.....	E2-27
E2-20.	Alpha, for volatilization factor (cm ² /s).....	E2-30
E2-21.	Effective diffusivity (cm ² /s).....	E2-30
E2-22.	Soil/air partition coefficient for volatile COPCs.....	E2-30
E2-23.	Volatilization factor for volatile COPCs (m ³ /kg).....	E2-30

E2-24. Area weighted average airborne volatile concentration (mg/m ³) based on 0–0.5ft soil depth.....	E2-30
E2-25. Airborne contaminant concentrations, fugitive dust (mg/m ³ or pCi/m ³), based on 0–0.5 ft depth for the current worker scenario.....	E2-31
E2-26. Intake, inhalation of fugitive dust, noncarcinogens (mg/kg-day) for the current worker scenario.....	E2-32
E2-27. Intake, inhalation of fugitive dust, carcinogens (mg/kg-day or pCi/kg-day) for the current worker scenario.....	E2-33
E2-28. Intake, volatile inhalation, soil, carcinogenic (mg/kg-day or pCi/kg-day) for the current worker scenario.....	E2-34
E2-29. Intake, volatile inhalation, soil, noncarcinogenic (mg/kg-day) for the current worker scenario.....	E2-34
E2-30. Exposure factor from external radiation, based on area weighted average soil concentrations, carcinogenic (pCi-yr/g) for the current worker scenario.	E2-35
E2-31. Intake, dermal absorption of soil, carcinogenic (mg/kg-day) for the current worker scenario.....	E2-35
E2-32. Intake, dermal absorption of soil, noncarcinogenic (mg/kg-day) for the current worker scenario.....	E2-38
E2-33. 0–0.5 feet original exposure point concentrations (mg/kg or pCi/g) for the current worker scenario.	E2-41
E2-34. 0–4 feet original exposure point concentrations (mg/kg or pCi/g) for the current worker scenario.....	E2-44
E2-35. Site/area dimensions for the current worker scenario.....	E2-47
E2-36. 0–0.5 feet, average radioactive decayed exposure point concentrations by site, year 0 to 25 (pCi/g) for the current worker scenario.....	E2-48
E2-37. 0–4 feet, rad decayed exposure point concentrations by site, year 0 to 25 (pCi/g) for the currnt worker scenario.	E2-49
E2-38. 0–0.5 feet, area weighted average of exposure point concentrations (mg/kg or pCi/g) for the current worker scenario.	E2-50
E2-39. 0–4 feet, area weighted average of exposure point concentrations (mg/kg or pCi/g) for the current worker scenario.	E2-51
E2-40. Exposure parameters for the current worker scenario.	E2-52

Table E2-1. Total risks by exposure pathway at each site/area for the current worker scenario.

	Exposure Pathway				
	Ingestion of Soil	Inhalation of Fugitive Dust	Inhalation of Volatiles from Soil	External Radiation Exposure ^a	Dermal Absorption of Soil
BORAX-01	4E-08	2E-09	—	2E-04	—
BORAX-02	3E-08				
BORAX-08	5E-08				
BORAX-09	1E-08				
EBR-08	— ^b	— ^b	—	—	— ^b
EBR-10	—				
LCCDA-01	8E-07	2E-08	—	6E-05	—
LCCDA-02	2E-07				
OMRE	4E-06	3E-09	—	1E-04	6E-06
Burnring	— ^c	— ^c	—	—	— ^c
Firestation Area 1	3E-07	5E-10	7E-15	—	3E-06
Firestation Area 2	7E-08				7E-07
Firestation Area 3	5E-07				9E-06
Firestation Area 4	7E-07				7E-06
Fieldstation Area 1	6E-06	1E-08	—	—	6E-05
Mine Fuze Area 2	—	4E-11	—	—	—
Mine Fuze Area 3	4E-04				3E-03
NOAA Area 2	2E-09	1E-09	—	—	1E-08
NOAA Area 2a	5E-06				4E-05
NOAA Area 3	2E-06				2E-05
NOAA Area 5	1E-05				1E-04
NOAA Area 6	3E-06				3E-05
NODA Area 2	7E-06	5E-08	1E-13	—	6E-06
NODA Area 3	— ^d				— ^d
NODA Area 4	2E-06				3E-05
CFA-633	4E-07	7E-10	—	—	7E-07

Lack of risk values in this table indicates that no COPCs were present at this site/area to be evaluated for the specific pathway.

- a. If no risk values are presented in this column for a site/area than no radionuclides were retained in the HHRA.
- b. TPH-diesel was evaluated using the RBCA model (see section 8).
- c. Slope factors are not available for 4-Chloro-3-methylphenol. Consequently, risk values from this exposure pathway were not calculated.
- d. Slope factors are not available for 2-Pentanone, cadmium, and thallium. Consequently, risk values from this exposure pathway were not calculated.

Table E2-2. Total risks by exposure pathway and group for the current worker scenario.

	Exposure Pathway				
	Ingestion of Soil	Inhalation of Fugitive Dust	Inhalation of Volatiles from Soil	External Radiation Exposure ^a	Dermal Absorption of Soil
BORAX	1E-07	2E-09	—	2E-04	NC
EBR ^b	NC	NC	—	0E+00	NC
LCCDA	1E-06	2E-08	—	6E-05	NC
OMRE	4E-06	3E-09	—	1E-04	6E-06
Burnring ^c	NC	NC	—	—	NC
Firestation	2E-06	5E-10	7E-15	—	2E-05
Fieldstation	6E-06	1E-08	—	—	6E-05
Mine Fuze	4E-04	4E-11	—	—	3E-03
NOAA	2E-05	1E-09	—	—	2E-04
NODA	8E-06	5E-08	1E-13	—	3E-05
CFA-633	4E-07	7E-10	—	—	7E-07

Lack of risk values in this table indicates that no COPCs were present at this site/area to be evaluated for the specific pathway.

NC = Not calculated, risk values could not be determined because slope factors were not available for COPCs at this site/area or COPCs were comprised of radionuclides only.

a. If no risk values are presented in this column for a site/area than no radionuclides were retained in the HHRA.

b. TPH-diesel was evaluated using the RBCA model (see section 8).

c. Slope factors are not available for 4-Chloro-3-methylphenol. Consequently, risk values from this exposure pathway were not calculated.

Table E2-3. Total risk at each site/group for the current worker scenario.

	Total Risk
BORAX	2E-04
EBR	— ^a
LCCDA	6E-05
OMRE	1E-04
Burnring	— ^b
Firestation	2E-05
Fieldstation	6E-05
Mine Fuze	4E-03
NOAA	2E-04
NODA	4E-05
CFA-633	1E-06

a. TPH-diesel was evaluated using the RBCA model (see section 8).

b. Slope factors are not available for 4-Chloro-3-methylphenol. Consequently, risk values from this exposure pathway were not calculated.

Table E2-4. Risk by ingestion of soil, carcinogens for the current worker scenario.

COPCs	BORAX-01	BORAX-02	BORAX-08	BORAX-09	EBR-08 ^a	LCCDA-01	LCCDA-02	OMRE	Burnring	Firestation Area 1
2,4,6-Trinitrotoluene	—	—	—	—	—	—	—	—	—	3.39E-07
2-Amino-4,6-Dinitrotoluene	—	—	—	—	—	—	—	—	—	—
2-Pentanone	—	—	—	—	—	—	—	—	—	—
4-Amino-2,6-Dinitrotoluene	—	—	—	—	—	—	—	—	—	—
4-Chloro-3-methylphenol	—	—	—	—	—	—	—	—	NTD	—
Antimony	—	—	—	—	—	—	—	—	—	—
Arsenic	—	—	—	—	—	—	—	—	—	—
Benzene	—	—	—	—	—	—	—	—	—	—
Benzo(a)pyrene	—	—	—	—	—	—	—	2.21E-07	—	—
Benzo(g,h,i)perylene	—	—	—	—	—	—	—	—	—	—
Cadmium	—	—	—	—	—	—	—	—	—	—
Chrysene	—	—	—	—	—	—	—	3.39E-06	—	—
Copper	—	—	—	—	—	—	—	—	—	—
Lead	—	—	—	—	—	—	—	—	—	—
Methapyrilene	—	—	—	—	—	—	—	—	—	—
Phenanthrene	—	—	—	—	—	—	—	—	—	—
RDX	—	—	—	—	—	—	—	—	—	—
Thallium	—	—	—	—	—	—	—	—	—	—
TPH-Diesel	—	—	—	—	—	—	—	—	—	—
Cs-137	1.68E-08	3.14E-08	5.43E-08	1.09E-08	—	3.76E-08	—	2.73E-07	—	—
—	—	—	—	—	—	6.43E-07	2.02E-07	—	—	—
U-235	3.53E-09	3.39E-09	—	—	—	1.77E-09	—	9.45E-10	—	—
U-238	1.61E-08	—	—	—	—	6.81E-08	—	—	—	—
Total for Site	3.65E-08	3.48E-08	5.43E-08	1.09E-08	NC	7.50E-07	2.02E-07	3.89E-06	NC	3.39E-07

Notes: Blank cells indicate that this chemical was not a COPC at this site.

NTD = Indicates that no slope factors were available exist for the COPC.

NC = Not calculated, risk values could not be determined because slope factors were not available for COPCs at this site/area or COPCs were comprised of radionuclides only.

a. TPH-diesel was evaluated using the RBCA model (see section 8).

Table E2-4. (continued).

COPCs	Firestation			Fieldstation		Mine Fuze		NOAA			
	Area 2	Area 3	Area 4	Area 1	Area 2	Area 3	Area 2a	Area 3	Area 5	Area 6	
2,4,6-Trinitrotoluene	6.97E-08	—	7.11E-07	6.01E-06	—	3.77E-04	4.72E-06	2.19E-06	1.04E-05	2.62E-06	
2-Amino-4,6-Dinitrotoluene	—	—	—	—	—	—	—	—	—	—	
2-Pentanone	—	—	—	—	—	—	—	—	—	—	
4-Amino-2,6-Dinitrotoluene	—	—	—	7.65E-08	—	—	—	—	—	—	
4-Chloro-3-methylphenol	—	—	—	—	—	—	—	—	—	—	
Antimony	—	—	—	—	—	—	—	—	—	—	
Arsenic	—	—	—	—	—	—	—	—	—	—	
Benzene	—	—	—	—	—	—	—	—	—	—	
Benzo(a)pyrene	—	2.33E-07	—	—	—	—	—	—	—	—	
Benzo(g,h,i)perylene	—	—	—	—	—	—	—	—	—	—	
Cadmium	—	—	—	—	—	—	—	—	—	—	
Chrysene	—	—	—	—	—	—	—	—	—	—	
Copper	—	—	—	—	—	—	—	—	—	—	
Lead	—	—	—	—	—	—	—	—	—	—	
Methapyrilene	—	—	—	—	—	—	—	—	—	—	
Phenanthrene	—	2.33E-07	—	—	—	—	—	—	—	—	
RDX	—	—	—	—	—	—	—	2.35E-08	3.56E-08	—	
Thallium	—	—	—	—	—	—	—	—	—	—	
TPH-Diesel	—	—	—	—	—	—	—	—	—	—	
Cs-137	—	—	—	—	—	—	—	—	—	—	
Ra-226	—	—	—	—	—	—	—	—	—	—	
U-235	—	—	—	—	—	—	—	—	—	—	
U-238	—	—	—	—	—	—	—	—	—	—	
Total for Site	6.97E-08	4.66E-07	7.11E-07	6.09E-06	NC	3.77E-04	4.75E-06	2.23E-06	1.05E-05	2.92E-06	

Table E2-4. (continued).

COPCs	NODA				CFA-633
	Area 2	Area 3	Area 4		
2,4,6-Trinitrotoluene	1.67E-08	—	—	—	3.51E-08
2-Amino-4,6-Dinitrotoluene	—	—	—	—	—
2-Pentanone	NTD	NTD	—	—	—
4-Amino-2,6-Dinitrotoluene	—	—	—	—	—
4-Chloro-3-methylphenol	NTD	—	—	—	—
Antimony	NTD	—	—	—	—
Arsenic	—	—	—	—	—
Benzene	—	—	—	—	—
Benzo(a)pyrene	—	—	—	1.33E-06	—
Benzo(g,h,i)perylene	2.52E-10	—	—	—	—
Cadmium	—	NTD	—	—	—
Chrysene	—	—	—	—	—
Copper	NTD	—	—	—	—
Lead	NTD	—	—	—	—
Methapyriline	—	—	NTD	—	—
Phenanthrene	—	—	—	4.39E-07	—
RDX	6.57E-06	—	—	—	3.79E-07
Thallium	NTD	NTD	—	—	—
TPH-Diesel	—	—	NTD	—	—
Cs-137	—	—	—	—	—
Ra-226	—	—	—	—	—
U-235	—	—	—	—	—
U-238	—	—	—	—	—
Total for Site	6.59E-06	NC	1.77E-06	4.14E-07	

Table E2-5. Risk by inhalation of fugitive dust, carcinogens for the current worker scenario.

COPCs	BORAX	EBR	LCCDA	OMRE	Burnring	Firestation	Fieldstation	Mine Fuze	NOAA	NODA	CFA-633
2,4,6-Trinitrotoluene	—	—	—	—	—	4.52E-10	1.04E-08	4.21E-11	1.39E-09	5.83E-12	6.06E-11
2-Amino-4,6-Dinitrotoluene	—	—	—	—	—	—	—	—	—	—	—
2-Pentanone	—	—	—	—	—	—	—	—	—	NTD	—
4-Amino-2,6-Dinitrotoluene	—	—	—	—	—	—	1.32E-10	—	—	—	—
4-Chloro-3-methylphenol	—	—	—	—	NTD	—	—	—	—	NTD	—
Antimony	—	—	—	—	—	—	—	—	—	NTD	—
Arsenic	—	—	—	—	—	—	—	—	—	—	—
Benzene	—	—	—	—	—	—	—	—	—	—	—
Benzo(a)pyrene	—	—	—	1.62E-10	—	8.74E-14	—	—	—	8.91E-13	—
Benzo(g,h,i)perylene	—	—	—	—	—	—	—	—	—	NTD	—
Cadmium	—	—	—	—	—	—	—	—	—	4.45E-08	—
Chrysene	—	—	—	2.49E-09	—	—	—	—	—	—	—
Copper	—	—	—	—	—	—	—	—	—	NTD	—
Lead	—	—	—	—	—	—	—	—	—	NTD	—
Methapyrilene	—	—	—	—	—	—	—	—	—	NTD	—
Phenanthrene	—	—	—	—	—	8.74E-14	—	—	—	2.94E-13	—
RDX	—	—	—	—	—	—	—	—	1.33E-11	2.30E-09	6.54E-10
Thallium	—	—	—	—	—	—	—	—	—	NTD	—
TPH-Diesel	—	—	—	—	—	—	—	—	—	NTD	—
Cs-137	4.36E-11	—	1.88E-11	2.85E-10	—	—	—	—	—	—	—
Ra-226	—	—	6.64E-09	—	—	—	—	—	—	—	—
U-235	5.67E-10	—	4.21E-10	4.69E-10	—	—	—	—	—	—	—
U-238	1.12E-09	—	1.64E-08	—	—	—	—	—	—	—	—
Total for Site	1.73E-09	NC	2.35E-08	3.40E-09	NC	4.53E-10	1.05E-08	4.21E-11	1.42E-09	4.68E-08	7.15E-10

Notes: Blank cells indicate that this chemical was not a COPC at this site.

NTD = Indicates that no slope factors were available for the COPC.

NC = Not calculated, risk values could not be determined because slope factors were not available for COPCs at this site/area or COPCs were comprised of radionuclides only.

a. TPH-diesel was evaluated using the RBCA model (see section 8).

Table E2-6. Risk by inhalation of volatiles from soil, carcinogens for the current worker scenario.

COPCs	Firestation	NODA	OMRE
2,4,6-Trinitrotoluene	—	—	—
2-Amino-4,6-Dinitrotoluene	—	—	—
2-Pentanone	—	—	—
4-Amino-2,6-Dinitrotoluene	—	—	—
4-Chloro-3-methylphenol	—	—	—
Antimony	—	—	—
Arsenic	—	—	—
Benzene	—	—	—
Benzo(a)pyrene	—	—	—
Benzo(g,h,i)perylene	—	—	—
Cadmium	—	—	—
Chrysene	—	—	2.39E-12
Copper	—	—	—
Lead	—	—	—
Methapyrilene	—	—	—
Phenanthrene	6.94E-15	1.30E-13	—
RDX	—	—	—
Thallium	—	—	—
TPH-Diesel	—	—	—
<u>Total for Site</u>	<u>6.94E-15</u>	<u>1.30E-13</u>	<u>2.39E-12</u>

Notes: Blank cells indicate that this chemical was not a COPC at this site or that no slope factors were available for the COPC.

Table E2-7. Risk by external radiation exposure, carcinogens for the current worker scenario.

COPCs	BORAX	EBR	LCCDA	OMRE	Burnring	Firestation	Fieldstation	Mine Fuze	NOAA	NODA	CFA-633
Cs-137	1.98E-04	—	3.77E-05	1.11E-04	—	—	—	—	—	—	—
Ra-226	—	—	2.15E-05	—	—	—	—	—	—	—	—
U-235	1.32E-07	—	1.62E-07	9.50E-08	—	—	—	—	—	—	—
U-238	1.63E-11	—	2.25E-10	—	—	—	—	—	—	—	—
Total for Site	<u>1.98E-04</u>	—	5.94E-05	1.11E-04	—	—	—	—	—	—	—

Notes: Blank cells indicate that this chemical was not a COPC at this site.

Table E2-8. Risk by dermal absorption of soil, carcinogens for the current worker scenario.

COPCs	BORAX-01	BORAX-02	BORAX-08	BORAX-09	EBR-08 ^a	EBR-10	LCCDA-01	LCCDA-02	OMRE	Burnring	Firestation Area 1
2,4,6-Trinitrotoluene	—	—	—	—	—	—	—	—	—	—	3.13E-06
2-Amino-4,6-Dinitrotoluene	—	—	—	—	—	—	—	—	—	—	—
2-Pentanone	—	—	—	—	—	—	—	—	—	—	—
4-Amino-2,6-Dinitrotoluene	—	—	—	—	—	—	—	—	—	—	—
4-Chloro-3-methylphenol	—	—	—	—	—	—	—	—	—	NTD	—
Arsenic	—	—	—	—	—	—	—	—	—	—	—
Benzene	—	—	—	—	—	—	—	—	—	—	—
Benzo(a)pyrene	—	—	—	—	—	—	—	—	2.65E-06	—	—
Benzo(g,h,i)perylene	—	—	—	—	—	—	—	—	—	—	—
Chrysene	—	—	—	—	—	—	—	—	3.13E-06	—	—
Methapyrilene	—	—	—	—	—	—	—	—	—	—	—
Phenanthrene	—	—	—	—	—	—	—	—	—	—	—
RDX	—	—	—	—	—	—	—	—	—	—	—
TPH-Diesel	—	—	—	—	—	—	—	—	—	—	—
Total for Site	NC	NC	NC	NC	NC	NC	NC	NC	5.79E-06	NC	3.13E-06

Notes: Blank cells indicate that this chemical was not a COPC at this site.

NTD = Indicates that no slope factors were available for the COPC.

NC = Not calculated, risk values could not be determined because slope factors were not available for COPCs at this site/area or COPCs were comprised of radionuclides only.

a. TPH-diesel was evaluated using the RBCA model (see section 8).

Table E2-8. (continued).

COPCs	Firestation			Fieldstation		Mine Fuze			NOAA		
	Area 2	Area 3	Area 4	Area 1	Area 2	Area 3	Area 2	Area 2a	Area 3	Area 5	Area 6
2,4,6-Trinitrotoluene	6.44E-07	—	6.57E-06	5.56E-05	—	3.49E-03	—	4.36E-05	2.03E-05	9.60E-05	2.42E-05
2-Amino-4,6-Dinitrotoluene	—	—	—	—	—	—	—	—	—	—	—
2-Pentanone	—	—	—	—	—	—	—	—	—	—	—
4-Amino-2,6-Dinitrotoluene	—	—	—	7.07E-07	—	—	1.41E-08	—	—	—	—
4-Chloro-3-methylphenol	—	—	—	—	—	—	—	—	—	—	—
Arsenic	—	—	—	—	—	—	—	—	—	—	—
Benzene	—	—	—	—	—	—	—	—	—	—	—
Benzo(a)pyrene	—	2.80E-06	—	—	—	—	—	—	—	—	—
Benzo(g,h,i)perylene	—	—	—	—	—	—	—	—	—	—	—
Chrysene	—	—	—	—	—	—	—	—	—	—	—
Methapyrilene	—	—	—	—	—	—	—	—	—	—	—
Phenanthrene	—	6.45E-06	—	—	—	—	—	—	—	—	—
RDX	—	—	—	—	—	—	—	2.18E-08	3.29E-08	—	—
TPH-Diesel	—	—	—	—	—	—	—	—	—	—	—
Total for Site	6.44E-07	9.25E-06	6.57E-06	5.63E-05	NC	3.49E-03	1.41E-08	4.37E-05	2.03E-05	9.7604E-05	2.42E-05

Table E2-8. (continued).

COPCs	NODA				CFA-633
	Area 2	Area 3	Area 4	CFA	
2,4,6-Trinitrotoluene	1.54E-07	—	—	—	3.25E-07
2-Amino-4,6-Dinitrotoluene	—	—	—	—	—
2-Pentanone	NTD	NTD	—	—	—
4-Amino-2,6-Dinitrotoluene	—	—	—	—	—
4-Chloro-3-methylphenol	NTD	—	—	—	—
Arsenic	—	—	—	—	—
Benzene	—	—	—	—	—
Benzo(a)pyrene	—	—	—	1.60E-05	—
Benzo(g,h,i)perylene	2.33E-09	—	—	—	—
Chrysene	—	—	—	—	—
Methapyrilene	—	—	NTD	—	—
Phenanthrene	—	—	1.22E-05	—	—
RDX	6.07E-06	—	—	3.50E-07	—
TPH-Diesel	—	—	NTD	—	—
Total for Site	6.26E-06	NC	2.81E-05	6.75E-07	

Table E2-9. Total hazard quotients by exposure pathway at each site/area for the current worker scenario.

	Exposure Pathway			
	Ingestion of Soil	Inhalation of Fugitive Dust	Inhalation of Volatiles from Soil	Dermal Absorption of Soil
BORAX-01 ^a	—	—	—	—
BORAX-02 ^a	—	—	—	—
BORAX-08 ^a	—	—	—	—
BORAX-09 ^a	—	—	—	—
EBR-08 ^b	—	—	—	—
EBR-10	—	—	—	—
LCCDA-01 ^c	—	—	—	—
LCCDA-02 ^c	—	—	—	—
OMRE ^d	—	—	—	—
Burnring ^e	—	—	—	—
Firestation Area 1	6E-02	8E-05	NC	1E-03
Firestation Area 2	1E-02	—	—	3E-04
Firestation Area 3	— ^f	—	—	— ^f
Firestation Area 4	1E-01	—	—	3E-03
Fieldstation Area 1	1E+00	2E-03	—	3E-02
Mine Fuze Area 2	—	8E-06	—	—
Mine Fuze Area 3	7E+01	—	—	2E+00
NOAA Area 2	3E-04	3E-04	—	7E-06
NOAA Area 2a	9E-01	—	—	2E-02
NOAA Area 3	4E-01	—	—	9E-03
NOAA Area 5	2E+00	—	—	5E-02
NOAA Area 6	5E-01	—	—	1E-02
NODA Area 2	1E-01	2E-05	—	2E-04
NODA Area 3	8E-02	—	—	— ^g
NODA Area 4	— ^h	—	—	— ^h
CFA-633	1E-02	2E-05	—	2E-04

Lack of risk values in this table indicates that no COPCs were present at this site/area to be evaluated for the specific pathway.

NC = Not calculated, risk values could not be determined because reference doses (RfDs) were not available for COPCs at this site/area or COPCs were comprised of radionuclides only.

- a. COPCs at all BORAX sites included radionuclides only.
- b. TPH-diesel was evaluated using the RBCA model (see section 8).
- c. COPCs at LCCDA-01 and LCCDA-02 included radionuclides only.
- d. RfDs are not available for benzo(a)pyrene and chrysene. Consequently, risk values for all exposure pathways could not be calculated.
- e. RfDs are not available for 4-Chloro-3-methylphenol. Consequently, risk values for all exposure pathways could not be calculated.
- f. RfDs are not available for benzo(a)pyrene and phenanthrene. Consequently, risk values from this exposure pathway were not calculated.
- g. RfDs are not available for 2-pentanone. Consequently, risk values from this exposure pathway were not calculated.
- h. RfDs are not available for benzo(a)pyrene, methapyrilene, phenanthrene, and TPH-diesel. Consequently, risk values from this exposure pathway were not calculated.

Table E2-10. Total hazard quotients by exposure pathway and group for the current worker scenario.

	Exposure Pathway			
	Ingestion of Soil	Inhalation of Fugitive Dust	Inhalation of Volatiles from Soil	Dermal Absorption of Soil
BORAX ^a	NC	NC	—	NC
EBR ^b	NC	NC	—	NC
LCCDA ^c	NC	NC	—	NC
OMRE ^d	NC	NC	—	NC
Burnring ^e	NC	NC	—	NC
Firestation	2E-01	8E-05	NC	5E-03
Fieldstation	1E+00	2E-03	—	3E-02
Mine Fuze	7E+01	8E-06	—	2E+00
NOAA	4E+00	3E-04	—	9E-02
NODA	2E-01	2E-05	NC	2E-04
CFA-633	1E-02	2E-05	—	2E-04

NC = Not calculated, risk values could not be determined because RfDs were not available for COPCs at this site/area or COPCs were comprised of radionuclides only.

a. COPCs at all BORAX sites included radionuclides only.

b. TPH-diesel was evaluated using the RBCA model (see section 8).

c. COPCs at LCCDA-01 and LCCDA-02 included radionuclides only.

d. RfDs are not available for benzo(a)pyrene and chrysene. Consequently, risk values for all exposure pathways could not be calculated.

e. RfDs are not available for 4-Chloro-3-methylphenol. Consequently, risk values for all exposure pathways could not be calculated.

Table E2-11. Total hazard quotients at each site/group for the current worker scenario.

	Total Hazard Quotient
BORAX	a
EBR	b
LCCDA	c
OMRE	d
Burnring	e
Firestation	2E-01
Fieldstation	1E+00
Mine Fuze	7E+01
NOAA	4E+00
NODA	2E-01
CFA-633	1E-02

a. COPCs at all BORAX sites included radionuclides only.

b. TPH-diesel was evaluated using the RBCA model (see section 8).

c. COPCs at LCCDA-01 and LCCDA-02 included radionuclides only.

d. RfDs are not available for benzo(a)pyrene and chrysene. Consequently, risk values could not be calculated.

e. RfDs are not available for 4-Chloro-3-methylphenol. Consequently, risk values could not be calculated.

Table E2-12. Hazard quotients by ingestion of soil for the current worker scenario.

COPCs	BORAX-01	BORAX-02	BORAX-08	BORAX-09	EBR-08 ^a	EBR-10	LCCDA-01	LCCDA-02	OMRE	Burnring	Firestation Area 1
2,4,6-Trinitrotoluene	—	—	—	—	—	—	—	—	—	—	6.33E-02
2-Amino-4,6-Dinitrotoluene	—	—	—	—	—	—	—	—	—	—	—
2-Pentanone	—	—	—	—	—	—	—	—	—	—	—
4-Amino-2,6-Dinitrotoluene	—	—	—	—	—	—	—	—	—	—	—
4-Chloro-3-methylphenol	—	—	—	—	—	—	—	—	—	NTD	—
Antimony	—	—	—	—	—	—	—	—	—	—	—
Arsenic	—	—	—	—	—	—	—	—	—	—	—
Benzene	—	—	—	—	—	—	—	—	—	—	—
Benzo(a)pyrene	—	—	—	—	—	—	—	—	—	NTD	—
Benzo(g,h,i)perylene	—	—	—	—	—	—	—	—	—	—	—
Cadmium	—	—	—	—	—	—	—	—	—	—	—
Chrysene	—	—	—	—	—	—	—	—	—	NTD	—
Copper	—	—	—	—	—	—	—	—	—	—	—
Lead	—	—	—	—	—	—	—	—	—	—	—
Methapyrilene	—	—	—	—	—	—	—	—	—	—	—
Phenanthrene	—	—	—	—	—	—	—	—	—	—	—
RDX	—	—	—	—	—	—	—	—	—	—	—
Thallium	—	—	—	—	—	—	—	—	—	—	—
TPH-Diesel	—	—	—	—	—	—	—	—	—	—	—
Total for Site	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	6.33E-02

Notes: Blank cells indicate that this chemical was not a COPC at this site.

NTD = Indicates that no RfDs were available for the COPC

NC = Not calculated, risk values could not be determined because RfDs were not available for COPCs at this site/area or COPCs were comprised of radionuclides only.

a. TPH-diesel was evaluated using the RBCA model (see section 8).

Table E2-12. (continued).

COPCs	Firestation			Fieldstation			Mine Fuze			NOAA		
	Area 2	Area 3	Area 4	Area 1	Area 2	Area 3	Area 2	Area 2a	Area 3	Area 5	Area 6	
2,4,6-Trinitrotoluene	1.30E-02	—	1.33E-01	1.12E+00	—	7.04E+01	—	8.82E-01	4.09E-01	1.94E+00	4.90E-01	
2-Amino-4,6-Dinitrotoluene	—	—	—	—	—	—	—	—	—	—	—	
2-Pentanone	—	—	—	—	—	—	—	—	—	—	—	
4-Amino-2,6-Dinitrotoluene	2.65E-04	—	—	1.43E-02	—	—	2.86E-04	—	—	—	—	
4-Chloro-3-methylphenol	—	—	—	—	—	—	—	—	—	—	—	
Antimony	—	—	—	—	—	—	—	—	—	—	—	
Arsenic	—	—	—	—	—	—	—	—	—	—	—	
Benzene	—	—	—	—	—	—	—	—	—	—	—	
Benzo(a)pyrene	—	NTD	—	—	—	—	—	—	—	—	—	
Benzo(g,h,i)perylene	—	—	—	—	—	—	—	—	—	—	—	
Cadmium	—	—	—	—	—	—	—	—	—	—	—	
Chrysene	—	—	—	—	—	—	—	—	—	—	—	
Copper	—	—	—	—	—	—	—	—	—	—	—	
Lead	—	—	—	—	—	—	—	—	—	—	—	
Methapyrilene	—	—	—	—	—	—	—	—	—	—	—	
Phenanthrene	—	—	—	—	—	—	—	—	—	—	—	
RDX	—	—	—	—	—	—	—	2.00E-04	3.02E-04	—	—	
Thallium	—	—	—	—	—	—	—	—	—	—	—	
TPH-Diesel	—	—	—	—	—	—	—	—	—	—	—	
Total for Site	1.30E-02	NC	1.33E-01	1.14E+00	NC	7.04E+01	2.86E-04	8.82E-01	4.09E-01	1.94E+00	4.90E-01	

Table E2-12. (continued).

	COPCs	NODA			CFA-6333
		Area 2	Area 3	Area 4	
2,4,6-Trinitrotoluene	3.11E-03	—	—	—	6.56E-03
2-Amino-4,6-Dinitrotoluene	—	—	—	—	—
2-Pentanone	NTD	NTD	—	—	—
4-Amino-2,6-Dinitrotoluene	—	—	—	—	—
4-Chloro-3-methylphenol	NTD	—	—	—	—
Antimony	4.76E-03	—	—	—	—
Arsenic	—	—	—	—	—
Benzene	—	—	—	—	—
Benzo(a)pyrene	—	—	—	NTD	—
Benzo(g,h,i)perylene	NTD	—	—	—	—
Cadmium	—	2.87E-02	—	—	—
Chrysene	—	—	—	—	—
Copper	2.80E-03	—	—	—	—
Lead	NTD	—	—	—	—
Methapyrilene	—	—	NTD	—	—
Phenanthrene	—	—	NTD	—	—
RDX	5.58E-02	—	—	3.21E-03	—
Thallium	3.29E-02	4.81E-02	—	—	—
TPH-Diesel	—	—	NTD	—	—
Total for Site	1.00E-01	7.68E-02	NC	9.77E-03	—

Table E2-13. Hazard quotients by inhalation of fugitive dust, non-carcinogens for the current worker scenario.

COPCs	BORAX	EBR ^a	LCCDA	OMRE	Burnring	Firestation	Fieldstation	Mine Fuze	NOAA	NODA	CFA-633
2,4,6-Trinitrotoluene	—	—	—	—	—	8.44E-05	1.94E-03	7.85E-06	2.59E-04	1.09E-06	1.13E-05
2-Amino-4,6-Dinitrotoluene	—	—	—	—	—	—	—	—	—	—	—
2-Pentanone	—	—	—	—	—	—	—	—	—	NTD	—
4-Amino-2,6-Dinitrotoluene	—	—	—	—	—	—	2.47E-05	—	—	—	—
4-Chloro-3-methylphenol	—	—	—	—	NTD	—	—	—	—	NTD	—
Antimony	—	—	—	—	—	—	—	—	—	NTD	—
Arsenic	—	—	—	—	—	—	—	—	—	—	—
Benzene	—	—	—	—	—	—	—	—	—	—	—
Benzo(a)pyrene	—	—	—	NTD	—	NTD	—	—	—	NTD	—
Benzo(g,h,i)perylene	—	—	—	—	—	—	—	—	—	NTD	—
Cadmium	—	—	—	—	—	—	—	—	—	NTD	—
Chrysene	—	—	—	NTD	—	—	—	—	—	—	—
Copper	—	—	—	—	—	—	—	—	—	NTD	—
Lead	—	—	—	—	—	—	—	—	—	NTD	—
Methapyrilene	—	—	—	—	—	—	—	—	—	NTD	—
Phenanthrene	—	—	—	—	—	NTD	—	—	—	NTD	—
RDX	—	—	—	—	—	—	—	—	1.13E-07	1.95E-05	5.56E-06
Thallium	—	—	—	—	—	—	—	—	—	NTD	—
TPH-Diesel	—	—	—	—	—	—	—	—	—	NTD	—
Total for Site	NC	NC	NC	NC	NC	8.44E-05	1.96E-03	7.85E-06	259E-04	2.09E-05	1.69E-05

Notes: Blank cells indicate that this chemical was not a COPC at this site.

NTD = Indicates that no RfDs were available for the COPC.NC = Not calculated, risk values could not be determined because RfDs were not available for COPCs at this site/area or COPCs were comprised of radionuclides only.

a. TPH-diesel was evaluated using the RBCA model (see section 8).

Table E2-14. Hazard quotients by inhalation of volatiles from soil, non-carcinogens for the current worker scenario.

COPCs	Firestation	NODA	OMRE
2,4,6-Trinitrotoluene	—	—	—
2-Amino-4,6-Dinitrotoluene	—	—	—
2-Pentanone	—	—	—
4-Amino-2,6-Dinitrotoluene	—	—	—
4-Chloro-3-methylphenol	—	—	—
Antimony	—	—	—
Arsenic	—	—	—
Benzene	—	—	—
Benzo(a)pyrene	—	—	—
Benzo(g,h,i)perylene	—	—	—
Cadmium	—	—	—
Chrysene	—	—	NTD
Copper	—	—	—
Lead	—	—	—
Methapyrilene	—	—	—
Phenanthrene	NTD	NTD	—
RDX	—	—	—
Thallium	—	—	—
TPH-Diesel	—	—	—
Total for Site	NC	NC	NC

Notes: Blank cells indicate that this chemical was not a COPC at this site.

NTD = Indicates that no RfDs were available for the COPC.

NC = Not calculated, risk values could not be determined because RfDs were not available for COPCs at this site/area or COPCs were comprised of radionuclides only.

Table E2-15. Hazard quotients by dermal absorption of soil, non-carcinogens for the current worker scenario.

COPCs	BORAX-01	BORAX-02	BORAX-08	BORAX-09	EBR-08 ^a	EBR-10	LCCDA-01	LCCDA-02	OMRE	Burnring	Firestation Area 1
2,4,6-Trinitrotoluene	—	—	—	—	—	—	—	—	—	—	1.46E-03
2-Amino-4,6-Dinitrotoluene	—	—	—	—	—	—	—	—	—	—	—
2-Pentanone	—	—	—	—	—	—	—	—	—	—	—
4-Amino-2,6-Dinitrotoluene	—	—	—	—	—	—	—	—	—	—	—
4-Chloro-3-methylphenol	—	—	—	—	—	—	—	—	—	NTD	—
Arsenic	—	—	—	—	—	—	—	—	—	—	—
Benzene	—	—	—	—	—	—	—	—	—	—	—
Benzo(a)pyrene	—	—	—	—	—	—	—	—	NTD	—	—
Benzo(g,h,i)perylene	—	—	—	—	—	—	—	—	—	—	—
Chrysene	—	—	—	—	—	—	—	—	NTD	—	—
Methapyrilene	—	—	—	—	—	—	—	—	—	—	—
Phenanthrene	—	—	—	—	—	—	—	—	—	—	—
RDX	—	—	—	—	—	—	—	—	—	—	—
TPH-Diesel	—	—	—	—	—	—	—	—	—	—	—
Total for Site	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	1.46E-03

Notes: Blank cells indicate that this chemical was not a COPC at this site.

NTD = Indicates that no RfDs were available for the COPC in the MSTR TOX TBL.

NC = Not calculated, risk values could not be determined because RfDs were not available for COPCs at this site/area or COPCs were comprised of radionuclides only.

a. TPH-diesel was evaluated using the RBCA model (see section 8).

Table E2-15. (continued).

COPCs	Firestation			Fieldstation			Mine Fuze			NOAA		
	Area 2	Area 3	Area 4	Area 1	Area 2	Area 3	Area 2	Area 2a	Area 3	Area 5	Area 6	
2,4,6-Trinitrotoluene	3.01E-04	—	3.06E-03	2.59E-02	—	1.63E+00	—	2.04E-02	9.45E-03	4.48E-02	1.13E-02	
2-Amino-4,6-Dinitrotoluene	—	—	—	—	—	—	—	—	—	—	—	
2-Pentanone	—	—	—	—	—	—	—	—	—	—	—	
4-Amino-2,6-Dinitrotoluene	—	—	—	3.30E-04	—	—	6.60E-06	—	—	—	—	
4-Chloro-3-methylphenol	—	—	—	—	—	—	—	—	—	—	—	
Arsenic	—	—	—	—	—	—	—	—	—	—	—	
Benzene	—	—	—	—	—	—	—	—	—	—	—	
Benzo(a)pyrene	—	NTD	—	—	—	—	—	—	—	—	—	
Benzo(g,h,i)perylene	—	—	—	—	—	—	—	—	—	—	—	
Chrysene	—	—	—	—	—	—	—	—	—	—	—	
Methapyrilene	—	—	—	—	—	—	—	—	—	—	—	
Phenanthrene	—	NTD	—	—	—	—	—	—	—	—	—	
RDX	—	—	—	—	—	—	—	4.62E-07	6.98E-07	—	—	
TPH-Diesel	—	—	—	—	—	—	—	—	—	—	—	
Total for Site	3.01E-04	0.00E+00	3.06E-03	2.63E-02	NC	1.63E+00	6.60E-06	2.04E-02	9.45E-03	4.48E-02	1.13E-02	

Table E2-15. (continued).

COPCs	NODA				CFA-633
	Area 2	Area 3	Area 4		
2,4,6-Trinitrotoluene	7.18E-05	—	—	—	1.51E-04
2-Amino-4,6-Dinitrotoluene	—	—	—	—	—
2-Pentanone	NTD	NTD	—	—	—
4-Amino-2,6-Dinitrotoluene	—	—	—	—	—
4-Chloro-3-methylphenol	NTD	—	—	—	—
Arsenic	—	—	—	—	—
Benzene	—	—	—	—	—
Benzo(a)pyrene	—	—	NTD	—	—
Benzo(g,h,i)perylene	NTD	—	—	—	—
Chrysene	—	—	—	—	—
Methapyrylene	—	—	NTD	—	—
Phenanthrene	—	—	NTD	—	—
RDX	1.29E-04	—	—	7.43E-06	—
TPH-Diesel	—	—	NTD	—	—
Total for Site	2.16E-04	NC	NC	1.59E-04	—

Table E2-18. Intake, ingestion of surface soil (0–6 in.), carcinogen (mg/kg-day or pCi/kg-day) for the current worker scenario.

COPCs	BORAX-01	BORAX-02	BORAX-08	BORAX-09	EBR-08 ^a	EBR-10	LCCDA-01	LCCDA-02	OMRE	Burnring	Firestation Area 1
2,4,6-Trinitrotoluene	—	—	—	—	—	—	—	—	—	—	1.13E-05
2-Amino-4,6-Dinitrotoluene	—	—	—	—	—	—	—	—	—	—	—
2-Pentanone	—	—	—	—	—	—	—	—	—	—	—
4-Amino-2,6-Dinitrotoluene	—	—	—	—	—	—	—	—	—	—	—
4-Chloro-3-methylphenol	—	—	—	—	—	—	—	—	—	3.37E-08	—
Antimony	—	—	—	—	—	—	—	—	—	—	—
Arsenic	—	—	—	—	—	—	—	—	—	—	—
Benzene	—	—	—	—	—	—	—	—	—	—	—
Benzo(a)pyrene	—	—	—	—	—	—	—	—	3.02E-08	—	—
Benzo(g,h,i)perylene	—	—	—	—	—	—	—	—	—	—	—
Cadmium	—	—	—	—	—	—	—	—	—	—	—
Chrysene	—	—	—	—	—	—	—	—	4.65E-04	—	—
Copper	—	—	—	—	—	—	—	—	—	—	—
Lead	—	—	—	—	—	—	—	—	—	—	—
Methapyrilene	—	—	—	—	—	—	—	—	—	—	—
Phenanthrene	—	—	—	—	—	—	—	—	—	—	—
RDX	—	—	—	—	—	—	—	—	—	—	—
Thallium	—	—	—	—	—	—	—	—	—	—	—
TPH-Diesel	—	—	—	—	—	—	—	—	—	—	—
Cs-137	5.32E+02	9.93E+02	1.72E+03	3.45E+02	—	—	1.19E+03	—	8.63E+03	—	—
Ra-226	—	—	—	—	—	—	2.17E+03	6.84E+02	—	—	—
U-235	7.81E+01	7.50E+01	—	—	—	—	3.91E+01	—	2.09E+01	—	—
U-238	3.78E+02	—	—	—	—	—	1.59E+03	—	—	—	—

Note: A blank cell indicates that this COPC is not a chemical of concern at this site.

a. TPH-diesel was evaluated using the RBCA model (see section 8).

Table E2-18. (continued).

COPCs	Firestation			Fieldstation		Mine Fuze			NOAA		
	Area 2	Area 3	Area 4	Area 1	Area 2	Area 3	Area 2	Area 2a	Area 3	Area 5	Area 6
2,4,6-Trinitrotoluene	2.32E-06	—	2.37E-05	2.00E-04	—	1.26E-02	—	1.57E-04	7.31E-05	3.46E-04	8.75E-05
2-Amino-4,6-Dinitrotoluene	—	—	—	—	—	—	—	—	—	—	—
2-Pentanone	—	—	—	—	—	—	—	—	—	—	—
4-Amino-2,6-Dinitrotoluene	—	—	—	2.55E-06	—	—	5.10E-08	—	—	—	—
4-Chloro-3-methylphenol	—	—	—	—	—	—	—	—	—	—	—
Antimony	—	—	—	—	—	—	—	—	—	—	—
Arsenic	—	—	—	—	—	—	—	—	—	—	—
Benzene	—	—	—	—	—	—	—	—	—	—	—
Benzo(a)pyrene	—	3.19E-08	—	—	—	—	—	—	—	—	—
Benzo(g,h,i)perylene	—	—	—	—	—	—	—	—	—	—	—
Cadmium	—	—	—	—	—	—	—	—	—	—	—
Chrysene	—	—	—	—	—	—	—	—	—	—	—
Copper	—	—	—	—	—	—	—	—	—	—	—
Lead	—	—	—	—	—	—	—	—	—	—	—
Methapyrilene	—	—	—	—	—	—	—	—	—	—	—
Phenanthrene	—	3.19E-08	—	—	—	—	—	—	—	—	—
RDX	—	—	—	—	—	—	—	2.14E-07	3.24E-07	—	—
Thallium	—	—	—	—	—	—	—	—	—	—	—
TPH-Diesel	—	—	—	—	—	—	—	—	—	—	—
Cs-137	—	—	—	—	—	—	—	—	—	—	—
Ra-226	—	—	—	—	—	—	—	—	—	—	—
U-235	—	—	—	—	—	—	—	—	—	—	—
U-238	—	—	—	—	—	—	—	—	—	—	—

Table E2-18. (continued).

COPCs	NODA			
	Area 2	Area 3	Area 4	CFA-633
2,4,6-Trinitrotoluene	5.55E-07	—	—	1.17E-06
2-Amino-4,6-Dinitrotoluene	—	—	—	—
2-Pentanone	9.29E-06	8.86E-06	—	—
4-Amino-2,6-Dinitrotoluene	—	—	—	—
4-Chloro-3-methylphenol	3.64E-08	—	—	—
Antimony	6.80E-07	—	—	—
Arsenic	—	—	—	—
Benzene	—	—	—	—
Benzo(a)pyrene	—	—	1.82E-07	—
Benzo(g,h,i)perylene	3.45E-08	—	—	—
Cadmium	—	5.13E-06	—	—
Chrysene	—	—	—	—
Copper	3.72E-05	—	—	—
Lead	4.83E-06	—	—	—
Methapyrilene	—	—	3.10E-07	—
Phenanthrene	—	—	6.01E-08	—
RDX	5.98E-05	—	—	3.45E-06
Thallium	8.22E-07	1.20E-06	—	—
TPH-Diesel	—	—	2.19E-04	—
Cs-137	—	—	—	—
Ra-226	—	—	—	—
U-235	—	—	—	—
U-238	—	—	—	—

Table E2-19. Intake, ingestion of surface soil (0–6 in.), noncarcinogen (mg/kg-day) for the current worker scenario.

COPCs	BORAX-01	BORAX-02	BORAX-08	BORAX-09	EBR-08 ^a	EBR-10	LCCDA-01	LCCDA-02	OMRE	Burnring	Firestation Area 1
2,4,6-Trinitrotoluene	—	—	—	—	—	—	—	—	—	—	3.16E-05
2-Amino-4,6-Dinitrotoluene	—	—	—	—	—	—	—	—	—	—	—
2-Pentanone	—	—	—	—	—	—	—	—	—	—	—
4-Amino-2,6-Dinitrotoluene	—	—	—	—	—	—	—	—	—	—	—
4-Chloro-3-methylphenol	—	—	—	—	—	—	—	—	—	—	9.44E-08
Antimony	—	—	—	—	—	—	—	—	—	—	—
Arsenic	—	—	—	—	—	—	—	—	—	—	—
Benzene	—	—	—	—	—	—	—	—	—	—	—
Benzo(a)pyrene	—	—	—	—	—	—	—	—	—	—	8.47E-08
Benzo(g,h,i)perylene	—	—	—	—	—	—	—	—	—	—	—
Cadmium	—	—	—	—	—	—	—	—	—	—	—
Chrysene	—	—	—	—	—	—	—	—	—	—	1.30E-03
Copper	—	—	—	—	—	—	—	—	—	—	—
Lead	—	—	—	—	—	—	—	—	—	—	—
Methapyrilene	—	—	—	—	—	—	—	—	—	—	—
Phenanthrene	—	—	—	—	—	—	—	—	—	—	—
RDX	—	—	—	—	—	—	—	—	—	—	—
Thallium	—	—	—	—	—	—	—	—	—	—	—
TPH-Diesel	—	—	—	—	—	—	—	—	—	—	—

Note: A blank cell indicates that this COPC is not a chemical of concern at this site.

a. TPH-diesel was evaluated using the RBCA model (see section 8).

Table E2-19. (continued).

COPCs	Firestation			Fieldstation		Mine Fuze			NOAA		
	Area 2	Area 3	Area 4	Area 1	Area 2	Area 3	Area 2	Area 2a	Area 3	Area 5	Area 6
2,4,6-Trinitrotoluene	6.51E-06	—	6.63E-05	5.61E-04	—	3.52E-02	—	4.41E-04	2.05E-04	9.69E-04	2.45E-04
2-Amino-4,6-Dinitrotoluene	—	—	—	—	—	—	—	—	—	—	—
2-Pentanone	—	—	—	—	—	—	—	—	—	—	—
4-Amino-2,6-Dinitrotoluene	—	—	—	7.14E-06	—	—	1.43E-07	—	—	—	—
4-Chloro-3-methylphenol	—	—	—	—	—	—	—	—	—	—	—
Antimony	—	—	—	—	—	—	—	—	—	—	—
Arsenic	—	—	—	—	—	—	—	—	—	—	—
Benzene	—	—	—	—	—	—	—	—	—	—	—
Benzo(a)pyrene	—	8.93E-08	—	—	—	—	—	—	—	—	—
Benzo(g,h,i)perylene	—	—	—	—	—	—	—	—	—	—	—
Cadmium	—	—	—	—	—	—	—	—	—	—	—
Chrysene	—	—	—	—	—	—	—	—	—	—	—
Copper	—	—	—	—	—	—	—	—	—	—	—
Lead	—	—	—	—	—	—	—	—	—	—	—
Methapyrilene	—	—	—	—	—	—	—	—	—	—	—
Phenanthrene	—	8.93E-08	—	—	—	—	—	—	—	—	—
RDX	—	—	—	—	—	—	—	5.99E-07	9.07E-07	—	—
Thallium	—	—	—	—	—	—	—	—	—	—	—
TPH-Diesel	—	—	—	—	—	—	—	—	—	—	—

Table E2-19. (continued).

COPCs	NODA				CFA-633
	Area 2	Area 3	Area 4		
2,4,6-Trinitrotoluene	1.55E-06	—	—	—	3.28E-06
2-Amino-4,6-Dinitrotoluene	—	—	—	—	—
2-Pentanone	2.60E-05	2.48E-05	—	—	—
4-Amino-2,6-Dinitrotoluene	—	—	—	—	—
4-Chloro-3-methylphenol	1.02E-07	—	—	—	—
Antimony	1.90E-06	—	—	—	—
Arsenic	—	—	—	—	—
Benzene	—	—	—	—	—
Benzo(a)pyrene	—	—	5.10E-07	—	—
Benzo(g,h,i)perylene	9.66E-08	—	—	—	—
Cadmium	—	1.44E-05	—	—	—
Chrysene	—	—	—	—	—
Copper	1.04E-04	—	—	—	—
Lead	1.35E-05	—	—	—	—
Methaphyrene	—	—	8.67E-07	—	—
Phenanthrene	—	—	1.68E-07	—	—
RDX	1.67E-04	—	—	9.64E-06	—
Thallium	2.30E-06	3.36E-06	—	—	—
TPH-Diesel	—	—	6.12E-04	—	—

Table E2-20. Alpha, for volatilization factor (cm²/s).

COPCs	Alpha
Phenanthrene	2.27E-06
Chrysene	4.19E-07

Note: Just for volatile COPCs.

Table E2-21. Effective diffusivity (cm²/s).

COPCs	Dei
Phenanthrene	4.10E-02
Chrysene	1.75E-02

Note: Just for volatile COPCs.

Table E2-22. Soil/air partition coefficient for volatile COPCs.

COPCs	Kas
Phenanthrene	1.54E-04
Chrysene	6.66E-05

Note: Just for volatile COPCs.

Table E2-23. Volatilization factor for volatile COPCs (m³/kg).

COPCs	Firestation	NODA	OMRE
Phenanthrene	9.69E+08	1.74E+08	—
Chrysene	—	—	1.19E+09

Note: Just for volatile COPCs.

Table E2-24. Area weighted average airborne volatile concentration (mg/m³) based on 0–0.5ft soil depth.

COPCs	Firestation	NODA	OMRE
Phenanthrene	9.25E-14	1.73E-12	—
Chrysene	—	—	3.19E-08

Notes: A blank cell indicates that the COPC was not a chemical of concern at this site.

Table E2-25. Airborne contaminant concentrations, fugitive dust (mg/m³ or pCi/m³), based on 0–0.5 ft depth for the current worker scenario.

COPCs	BORAX	EBR ^a	LCCDA	OMRE	Burnring	Firestation	Fieldstation	Mine Fuze	NOAA	NODA	CFA-633
2,4,6-Trinitrotoluene	—	—	—	—	—	6.23E-07	1.43E-05	5.79E-08	1.91E-06	8.04E-09	8.35E-08
2-Amino-4,6-Dinitrotoluene	—	—	—	—	—	—	—	—	—	—	—
2-Pentanone	—	—	—	—	—	—	—	—	—	6.38E-07	—
4-Amino-2,6-Dinitrotoluene	—	—	—	—	—	—	1.82E-07	—	—	—	—
4-Chloro-3-methylphenol	—	—	—	—	2.41E-09	—	—	—	—	5.28E-10	—
Antimony	—	—	—	—	—	—	—	—	—	9.85E-09	—
Arsenic	—	—	—	—	—	—	—	—	—	—	—
Benzene	—	—	—	—	—	—	—	—	—	—	—
Benzo(a)pyrene	—	—	—	2.16E-09	—	1.17E-12	—	—	—	1.19E-11	—
Benzo(g,h,i)perylene	—	—	—	—	—	—	—	—	—	5.00E-10	—
Cadmium	—	—	—	—	—	—	—	—	—	2.92E-07	—
Chrysene	—	—	—	3.32E-05	—	—	—	—	—	—	—
Copper	—	—	—	—	—	—	—	—	—	5.38E-07	—
Lead	—	—	—	—	—	—	—	—	—	6.99E-08	—
Methapyrilene	—	—	—	—	—	—	—	—	—	2.02E-11	—
Phenanthrene	—	—	—	—	—	1.17E-12	—	—	—	3.92E-12	—
RDX	—	—	—	—	—	—	—	—	4.98E-09	8.65E-07	2.46E-07
Thallium	—	—	—	—	—	—	—	—	—	8.02E-08	—
TPH-Diesel	—	—	—	—	—	—	—	—	—	1.42E-08	—
Cs-137	5.50E-05	—	2.37E-05	3.59E-04	—	—	—	—	—	—	—
Ra-226	—	—	5.82E-05	—	—	—	—	—	—	—	—
U-235	—	—	7.80E-07	8.70E-07	—	—	—	—	—	—	—
U-238	2.18E-06	—	3.18E-05	—	—	—	—	—	—	—	—

Notes: Blank cells indicate that this COPC was not a chemical of concern at this site.

a. TPH-diesel was evaluated using the RBCA model (see section 8).

Table E2-26. Intake, inhalation of fugitive dust, noncarcinogens (mg/kg-day) for the current worker scenario.

COPCs	BORAX	EBR ^a	LCCDA	OMRE	Burnring	Firestation	Fieldstation	Mine Fuze	NOAA	NODA	CFA-633
2,4,6-Trinitrotoluene	—	—	—	—	—	4.22E-08	9.69E-07	3.93E-09	1.30E-07	5.44E-10	5.66E-09
2-Amino-4,6-Dinitrotoluene	—	—	—	—	—	—	—	—	—	—	—
2-Pentanone	—	—	—	—	—	—	—	—	—	4.32E-08	—
4-Amino-2,6-Dinitrotoluene	—	—	—	—	—	—	1.23E-08	—	—	—	—
4-Chloro-3-methylphenol	—	—	—	—	1.63E-10	—	—	—	—	3.57E-11	—
Antimony	—	—	—	—	—	—	—	—	—	6.67E-10	—
Arsenic	—	—	—	—	—	—	—	—	—	—	—
Benzene	—	—	—	—	—	—	—	—	—	—	—
Benzo(a)pyrene	—	—	—	1.46E-10	—	7.90E-14	—	—	—	8.05E-13	—
Benzo(g,h,i)perylene	—	—	—	—	—	—	—	—	—	3.39E-11	—
Cadmium	—	—	—	—	—	—	—	—	—	1.98E-08	—
Chrysene	—	—	—	2.25E-06	—	—	—	—	—	—	—
Copper	—	—	—	—	—	—	—	—	—	3.65E-08	—
Lead	—	—	—	—	—	—	—	—	—	4.74E-09	—
Methapyrilene	—	—	—	—	—	—	—	—	—	1.37E-12	—
Phenanthrene	—	—	—	—	—	7.90E-14	—	—	—	2.65E-13	—
RDX	—	—	—	—	—	—	—	—	3.38E-10	5.86E-08	1.67E-08
Thallium	—	—	—	—	—	—	—	—	—	5.43E-09	—
TPH-Diesel	—	—	—	—	—	—	—	—	—	9.65E-10	—

Notes: Blank cells indicate that this COPC was not a chemical of concern at this site.

a. TPH-diesel was evaluated using the RBCA model (see section 8).

Table E2-27. Intake, inhalation of fugitive dust, carcinogens (mg/kg-day or pCi/kg-day) for the current worker scenario.

COPCs	BORAX	EBR ^a	LCCDA	OMRE	Burnring	Firestation	Fieldstation	Mine Fuze	NOAA	NODA	CFA-633
2,4,6-Trinitrotoluene	—	—	—	—	—	1.51E-08	3.46E-07	1.40E-09	4.63E-08	1.94E-10	2.02E-09
2-Amino-4,6-Dinitrotoluene	—	—	—	—	—	—	—	—	—	—	—
2-Pentanone	—	—	—	—	—	—	—	—	—	1.54E-08	—
4-Amino-2,6-Dinitrotoluene	—	—	—	—	—	—	4.40E-09	—	—	—	—
4-Chloro-3-methylphenol	—	—	—	—	5.82E-11	—	—	—	—	1.28E-11	—
Antimony	—	—	—	—	—	—	—	—	—	2.38E-10	—
Arsenic	—	—	—	—	—	—	—	—	—	—	—
Benzene	—	—	—	—	—	—	—	—	—	—	—
Benzo(a)pyrene	—	—	—	5.22E-11	—	2.82E-14	—	—	—	2.87E-13	—
Benzo(g,h,i)perylene	—	—	—	—	—	—	—	—	—	1.21E-11	—
Cadmium	—	—	—	—	—	—	—	—	—	7.06E-09	—
Chrysene	—	—	—	8.02E-07	—	—	—	—	—	—	—
Copper	—	—	—	—	—	—	—	—	—	1.30E-08	—
Lead	—	—	—	—	—	—	—	—	—	1.69E-09	—
Methapyrilene	—	—	—	—	—	—	—	—	—	4.88E-13	—
Phenanthrene	—	—	—	—	—	2.82E-14	—	—	—	9.48E-14	—
RDX	—	—	—	—	—	—	—	—	—	1.21E-10	2.09E-08
Thallium	—	—	—	—	—	—	—	—	—	—	1.94E-09
TPH-Diesel	—	—	—	—	—	—	—	—	—	—	3.45E-10
Cs-137	2.28E+00	—	9.85E-01	1.49E+01	—	—	—	—	—	—	—
Ra-226	—	—	2.41E+00	—	—	—	—	—	—	—	—
U-235	4.36E-02	—	3.24E-02	—	—	—	—	—	—	—	—
U-238	9.06E-02	—	1.32E+00	—	—	—	—	—	—	—	—

Notes: Blank cells indicate that this COPC was not a chemical of concern at this site.

a. TPH-diesel was evaluated using the RBCA model (see section 8).

Table E2-28. Intake, volatile inhalation, soil, carcinogenic (mg/kg-day or pCi/kg-day) for the current worker scenario.

COPCs	Firestation	NODA	OMRE
Phenanthrene	2.24E-15	4.19E-14	—
<u>Chrysene</u>	—	—	7.72E-10

Notes: A blank cell indicates that this COPC was not a chemical of concern at this site.

Table E2-29. Intake, volatile inhalation, soil, noncarcinogenic (mg/kg-day) for the current worker scenario.

COPCs	Firestation	NODA	OMRE
Phenanthrene	6.27E-15	1.17E-13	—
<u>Chrysene</u>	—	—	2.16E-09

Notes: A blank cell indicates that this COPC was not a chemical of concern at this site.

Table E2-30. Exposure factor from external radiation, based on area weighted average soil concentrations, carcinogenic (pCi-yr/g) for the current worker scenario.

COPCs	BORAX	EBR	LCCDA	OMRE	Burnring	Firestation	Fieldstation	Mine Fuze	NOAA	NODA	CFA-633
Cs-137	9.48E+01	—	1.81E+01	5.29E+01	—	—	—	—	—	—	—
Ra-226	—	—	3.19E+00	—	—	—	—	—	—	—	—
U-235	5.01E-01	—	6.15E-01	3.61E-01	—	—	—	—	—	—	—
U-238	1.09E+00	—	1.50E+01	—	—	—	—	—	—	—	—

Notes: A blank cell indicates that this COPC was not a chemical of concern at this site.

Table E2-31. Intake, dermal absorption of soil, carcinogenic (mg/kg-day) for the current worker scenario.

COPCs	BORAX-01	BORAX-02	BORAX-08	BORAX-09	EBR-08 ^a	EBR-10	LCCDA-01	LCCDA-02	OMRE	Burnring	Firestation Area 1
2,4,6-Trinitrotoluene	—	—	—	—	—	—	—	—	—	—	5.22E-06
2-Amino-4,6-Dinitrotoluene	—	—	—	—	—	—	—	—	—	—	—
2-Pentanone	—	—	—	—	—	—	—	—	—	—	—
4-Amino-2,6-Dinitrotoluene	—	—	—	—	—	—	—	—	—	—	—
4-Chloro-3-methylphenol	—	—	—	—	—	—	—	—	—	1.56E-08	—
Arsenic	—	—	—	—	—	—	—	—	—	—	—
Benzene	—	—	—	—	—	—	—	—	—	—	—
Benzo(a)pyrene	—	—	—	—	—	—	—	—	—	1.82E-08	—
Benzo(g,h,i)perylene	—	—	—	—	—	—	—	—	—	—	—
Chrysene	—	—	—	—	—	—	—	—	—	2.15E-05	—
Methapyrilene	—	—	—	—	—	—	—	—	—	—	—
Phenanthrene	—	—	—	—	—	—	—	—	—	—	—
RDX	—	—	—	—	—	—	—	—	—	—	—
TPH-Diesel	—	—	—	—	—	—	—	—	—	—	—

Notes: A blank cell indicates that this COPC was not a chemical of concern at this site, or that an absorption factor for this chemical is not available

a. TPH-diesel was evaluated using the RBCA model (see section 8).

Table E2-31. (continued).

COPCs	Firestation			Fieldstation		Mine Fuze			NOAA			
	Area 2	Area 3	Area 4	Area 1	Area 2	Area 3	Area 2	Area 2a	Area 3	Area 5	Area 6	
2,4,6-Trinitrotoluene	1.07E-06	—	1.09E-05	9.26E-05	—	5.81E-03	—	7.27E-05	3.38E-05	1.60E-04	4.04E-05	
2-Amino-4,6-Dinitrotoluene	—	—	—	—	—	—	—	—	—	—	—	
2-Pentanone	—	—	—	—	—	—	—	—	—	—	—	
4-Amino-2,6-Dinitrotoluene	—	—	—	1.18E-06	—	—	2.36E-08	—	—	—	—	
4-Chloro-3-methylphenol	—	—	—	—	—	—	—	—	—	—	—	
Arsenic	—	—	—	—	—	—	—	—	—	—	—	
Benzene	—	—	—	—	—	—	—	—	—	—	—	
Benzo(a)pyrene	—	1.92E-08	—	—	—	—	—	—	—	—	—	
Benzo(g,h,i)perylene	—	—	—	—	—	—	—	—	—	—	—	
Chrysene	—	—	—	—	—	—	—	—	—	—	—	
Methapyrilene	—	—	—	—	—	—	—	—	—	—	—	
Phenanthrene	—	4.42E-08	—	—	—	—	—	—	—	—	—	
RDX	—	—	—	—	—	—	—	9.89E-09	1.50E-08	—	—	
TPH-Diesel	—	—	—	—	—	—	—	—	—	—	—	

Table E2-31. (continued).

COPCs	NODA			
	Area 2	Area 3	Area 4	CFA-633
2,4,6-Trinitrotoluene	2.56E-07	—	—	5.41E-07
2-Amino-4,6-Dinitrotoluene	—	—	—	—
2-Pentanone	4.29E-06	4.09E-06	—	—
4-Amino-2,6-Dinitrotoluene	—	—	—	—
4-Chloro-3-methylphenol	1.68E-08	—	—	—
Arsenic	—	—	—	—
Benzene	—	—	—	—
Benzo(a)pyrene	—	—	1.09E-07	—
Benzo(g,h,i)perylene	1.59E-08	—	—	—
Chrysene	—	—	—	—
Methapyrilene	—	—	1.43E-07	—
Phenanthrene	—	—	8.33E-08	—
RDX	2.76E-06	—	—	1.59E-07
TPH-Diesel	—	—	1.01E-04	—

Table E2-32. Intake, dermal absorption of soil, noncarcinogenic (mg/kg-day) for the current worker scenario.

COPCs	BORAX-01	BORAX-02	BORAX-08	BORAX-09	EBR-08 ^a	EBR-10	LCCDA-01	LCCDA-02	OMRE	Burnring	Firestation Area 1
2,4,6-Trinitrotoluene	—	—	—	—	—	—	—	—	—	—	1.46E-05
2-Amino-4,6-Dinitrotoluene	—	—	—	—	—	—	—	—	—	—	—
2-Pentanone	—	—	—	—	—	—	—	—	—	—	—
4-Amino-2,6-Dinitrotoluene	—	—	—	—	—	—	—	—	—	—	—
4-Chloro-3-methylphenol	—	—	—	—	—	—	—	—	—	4.36E-08	—
Arsenic	—	—	—	—	—	—	—	—	—	—	—
Benzene	—	—	—	—	—	—	—	—	—	—	—
Benzo(a)pyrene	—	—	—	—	—	—	—	—	5.09E-08	—	—
Benzo(g,h,i)perylene	—	—	—	—	—	—	—	—	—	—	—
Chrysene	—	—	—	—	—	—	—	—	6.01E-05	—	—
Methapyrilene	—	—	—	—	—	—	—	—	—	—	—
Phenanthrene	—	—	—	—	—	—	—	—	—	—	—
RDX	—	—	—	—	—	—	—	—	—	—	—
<u>TPH-Diesel</u>	—	—	—	—	—	—	—	—	—	—	—

Notes: A blank cell indicates that this COPC was not a chemical of concern at this site, or an absorption factor for this chemical is not available.

a. TPH-diesel was evaluated using the RBCA model (see section 8).

Table E2-32. (continued).

COPCs	Firestation			Fieldstation		Mine Fuze			NOAA		
	Area 2	Area 3	Area 4	Area 1	Area 2	Area 3	Area 2	Area 2a	Area 3	Area 5	Area 6
2,4,6-Trinitrotoluene	3.01E-06	—	3.06E-05	2.59E-04	—	1.63E-02	—	2.04E-04	9.45E-05	4.48E-04	1.13E-04
2-Amino-4,6-Dinitrotoluene	—	—	—	—	—	—	—	—	—	—	—
2-Pentanone	—	—	—	—	—	—	—	—	—	—	—
4-Amino-2,6-Dinitrotoluene	—	—	—	3.30E-06	—	—	6.60E-08	—	—	—	—
4-Chloro-3-methylphenol	—	—	—	—	—	—	—	—	—	—	—
Arsenic	—	—	—	—	—	—	—	—	—	—	—
Benzene	—	—	—	—	—	—	—	—	—	—	—
Benzo(a)pyrene	—	5.36E-08	—	—	—	—	—	—	—	—	—
Benzo(g,h,i)perylene	—	—	—	—	—	—	—	—	—	—	—
Chrysene	—	—	—	—	—	—	—	—	—	—	—
Methapyrilene	—	—	—	—	—	—	—	—	—	—	—
Phenanthrene	—	1.24E-07	—	—	—	—	—	—	—	—	—
RDX	—	—	—	—	—	—	—	2.77E-08	4.19E-08	—	—
TPH-Diesel	—	—	—	—	—	—	—	—	—	—	—

Table E2-32. (continued).

COPCs	NODA				CFA-633
	Area 2	Area 3	Area 4	—	
2,4,6-Trinitrotoluene	7.18E-07	—	—	—	1.51E-06
2-Amino-4,6-Dinitrotoluene	—	—	—	—	—
2-Pentanone	1.20E-05	1.15E-05	—	—	—
4-Amino-2,6-Dinitrotoluene	—	—	—	—	—
4-Chloro-3-methylphenol	4.71E-08	—	—	—	—
Arsenic	—	—	—	—	—
Benzene	—	—	—	—	—
Benzo(a)pyrene	—	—	3.06E-07	—	—
Benzo(g,h,i)perylene	4.46E-08	—	—	—	—
Chrysene	—	—	—	—	—
Methaprylene	—	—	4.01E-07	—	—
Phenanthrene	—	—	2.33E-07	—	—
RDX	7.73E-06	—	—	4.46E-07	—
TPH-Diesel	—	—	2.83E-04	—	—

Table E2-33. 0–0.5 feet original exposure point concentrations (mg/kg or pCi/g) for the current worker scenario.

COPCs	BORAX-01	BORAX-02	BORAX-08	BORAX-09	EBR-08	EBR-10	LCCDA-01	LCCDA-02	OMRE	Burnring	Firestation Area 1
2,4,6-Trinitrotoluene	—	—	—	—	—	—	—	—	—	—	6.20E+01
2-Amino-4,6-Dinitrotoluene	—	—	—	—	—	—	—	—	—	—	—
2-Pentanone	—	—	—	—	—	—	—	—	—	—	—
4-Amino-2,6-Dinitrotoluene	—	—	—	—	—	—	—	—	—	—	—
4-Chloro-3-methylphenol	—	—	—	—	—	—	—	—	—	1.85E-01	—
Antimony	—	—	—	—	—	—	—	—	—	—	—
Arsenic	—	—	—	—	—	—	—	—	—	—	—
Benzene	—	—	—	—	—	—	—	—	—	—	—
Benzo(a)pyrene	—	—	—	—	—	—	—	—	1.66E-01	—	—
Benzo(g,h,i)perylene	—	—	—	—	—	—	—	—	—	—	—
Cadmium	—	—	—	—	—	—	—	—	—	—	—
Chrysene	—	—	—	—	—	—	—	—	2.55E+03	—	—
Copper	—	—	—	—	—	—	—	—	—	—	—
Lead	—	—	—	—	—	—	—	—	—	—	—
Methapyrilene	—	—	—	—	—	—	—	—	—	—	—
Phenanthrene	—	—	—	—	—	—	—	—	—	—	—
RDX	—	—	—	—	—	—	—	—	—	—	—
Thallium	—	—	—	—	—	—	—	—	—	—	—
TPH-Diesel	—	—	—	—	—	—	—	—	—	—	—
Cs-137	2.24E+00	4.18E+00	7.22E+00	1.45E+00	—	—	5.00E+00	—	3.63E+01	—	—
Ra-226	—	—	—	—	—	—	6.99E+00	2.20E+00	—	—	—
U-235	2.50E-01	2.40E-01	—	—	—	—	1.25E-01	—	6.69E-02	—	—
U-238	1.21E+00	—	—	—	—	—	5.10E+00	—	—	—	—

Notes: A blank cell indicates that the COPC was not a chemical of concern at this site/area.

Table E2-33. (continued).

COPCs	Firestation			Fieldstation		Mine fuze		NOAA			
	Area 2	Area 3	Area 4	Area 1	Area 2	Area 3	Area 2	Area 2a	Area 3	Area 5	Area 6
2,4,6-Trinitrotoluene	1.28E+01	—	1.30E+02	1.10E+03	—	6.90E+04	—	8.64E+02	4.01E+02	1.90E+03	4.80E+02
2-Amino-4,6-Dinitrotoluene	—	—	—	—	—	—	—	—	—	—	—
2-Pentanone	—	—	—	—	—	—	—	—	—	—	—
4-Amino-2,6-Dinitrotoluene	—	—	—	1.40E+01	—	—	2.80E-01	—	—	—	—
4-Chloro-3-methylphenol	—	—	—	—	—	—	—	—	—	—	—
Antimony	—	—	—	—	—	—	—	—	—	—	—
Arsenic	—	—	—	—	—	—	—	—	—	—	—
Benzene	—	—	—	—	—	—	—	—	—	—	—
Benzo(a)pyrene	—	1.75E-01	—	—	—	—	—	—	—	—	—
Benzo(g,h,i)perylene	—	—	—	—	—	—	—	—	—	—	—
Cadmium	—	—	—	—	—	—	—	—	—	—	—
Chrysene	—	—	—	—	—	—	—	—	—	—	—
Copper	—	—	—	—	—	—	—	—	—	—	—
Lead	—	—	—	—	—	—	—	—	—	—	—
Methapyrilene	—	—	—	—	—	—	—	—	—	—	—
Phenanthrene	—	1.75E-01	—	—	—	—	—	—	—	—	—
RDX	—	—	—	—	—	—	—	1.17E+00	1.78E+00	—	—
Thallium	—	—	—	—	—	—	—	—	—	—	—
TPH-Diesel	—	—	—	—	—	—	—	—	—	—	—
Cs-137	—	—	—	—	—	—	—	—	—	—	—
Ra-226	—	—	—	—	—	—	—	—	—	—	—
U-235	—	—	—	—	—	—	—	—	—	—	—
U-238	—	—	—	—	—	—	—	—	—	—	—

Table E2-33. (continued).

COPCs	NODA				CFA-633
	Area 2	Area 3	Area 4		
2,4,6-Trinitrotoluene	3.05E+00	—	—	—	6.43E+00
2-Amino-4,6-Dinitrotoluene	—	—	—	—	—
2-Pentanone	5.10E+01	4.86E+01	—	—	—
4-Amino-2,6-Dinitrotoluene	—	—	—	—	—
4-Chloro-3-methylphenol	2.00E-01	—	—	—	—
Antimony	3.73E+00	—	—	—	—
Arsenic	—	—	—	—	—
Benzene	—	—	—	—	—
Benzo(a)pyrene	—	—	—	1.00E+00	—
Benzo(g,h,i)perylene	1.89E-01	—	—	—	—
Cadmium	—	2.82E+01	—	—	—
Chrysene	—	—	—	—	—
Copper	2.04E+02	—	—	—	—
Lead	2.65E+01	—	—	—	—
Methapyrilene	—	—	1.70E+00	—	—
Phenanthrene	—	—	3.30E-01	—	—
RDX	3.28E+02	—	—	1.89E+01	—
Thallium	4.51E+00	6.59E+00	—	—	—
TPH-Diesel	—	—	1.20E+03	—	—
Cs-137	—	—	—	—	—
Ra-226	—	—	—	—	—
U-235	—	—	—	—	—
U-238	—	—	—	—	—

Table E2-34. 0–4 feet original exposure point concentrations (mg/kg or pCi/g) for the current worker scenario.

COPCs	BORAX-01	BORAX-02	BORAX-08	BORAX-09	EBR-08	EBR-10	LCCDA-01	LCCDA-02	OMRE	Burnring	Firestation Area 1
2,4,6-Trinitrotoluene	—	—	—	—	—	—	—	—	—	—	7.87E+00
2-Amino-4,6-Dinitrotoluene	—	—	—	—	—	—	—	—	—	—	—
2-Pentanone	—	—	—	—	—	—	—	—	—	—	—
4-Amino-2,6-Dinitrotoluene	—	—	—	—	—	—	—	—	—	—	—
4-Chloro-3-methylphenol	—	—	—	—	—	—	—	—	—	1.85E-01	—
Antimony	—	—	—	—	—	—	—	—	—	—	—
Arsenic	—	—	—	—	—	—	—	—	—	—	—
Benzene	—	—	—	—	—	—	—	—	—	—	—
Benzo(a)pyrene	—	—	—	—	—	—	—	—	1.66E-01	—	—
Benzo(g,h,i)perylene	—	—	—	—	—	—	—	—	—	—	—
Cadmium	—	—	—	—	—	—	—	—	—	—	—
Chrysene	—	—	—	—	—	—	—	—	3.19E+02	—	—
Copper	—	—	—	—	—	—	—	—	—	—	—
Lead	—	—	—	—	—	—	—	—	—	—	—
Methapyrilene	—	—	—	—	—	—	—	—	—	—	—
Phenanthrene	—	—	—	—	—	—	—	—	—	—	—
RDX	—	—	—	—	—	—	—	—	—	—	—
Thallium	—	—	—	—	—	—	—	—	—	—	—
TPH-Diesel	—	—	—	—	3.99E+04	—	—	—	—	—	—
Cs-137	9.54E+01	2.22E+00	1.36E+01	1.81E-01	—	—	8.68E+00	—	1.22E+01	—	—
Ra-226	—	—	—	—	—	—	8.74E-01	2.75E-01	—	—	—
U-235	3.13E-01	2.31E-01	—	—	—	—	2.25E-01	—	6.34E-02	—	—
U-238	1.38E+00	—	—	—	—	—	5.48E+00	—	—	—	—

Notes: A blank cell indicates that the COPC was not a chemical of concern at this site/area.

Table E2-34. (continued).

	Firestation		Fieldstation		Mine Fuze		NOAA				
	Area 2	Area 3	Area 4	Area 1	Area 2	Area 3	Area 2	Area 2a	Area 3	Area 5	Area 6
2,4,6-Trinitrotoluene	1.71E+00	—	1.21E+02	1.42E+02	—	1.00E+04	—	1.08E+02	5.03E+01	1.64E+03	4.80E+02
2-Amino-4,6-Dinitrotoluene	—	—	—	—	—	—	—	—	—	—	—
2-Pentanone	—	—	—	—	—	—	—	—	—	—	—
4-Amino-2,6-Dinitrotoluene	—	—	—	1.88E+00	—	—	1.58E-01	—	—	—	—
4-Chloro-3-methylphenol	—	—	—	—	—	—	—	—	—	—	—
Antimony	—	—	—	—	—	—	—	—	—	—	—
Arsenic	—	—	—	—	—	—	—	—	—	—	—
Benzene	—	—	—	—	—	—	—	—	—	—	—
Benzo(a)pyrene	—	1.75E-01	—	—	—	—	—	—	—	—	—
Benzo(g,h,i)perylene	—	—	—	—	—	—	—	—	—	—	—
Cadmium	—	—	—	—	—	—	—	—	—	—	—
Chrysene	—	—	—	—	—	—	—	—	—	—	—
Copper	—	—	—	—	—	—	—	—	—	—	—
Lead	—	—	—	—	—	—	—	—	—	—	—
Methapyrilene	—	—	—	—	—	—	—	—	—	—	—
Phenanthrene	—	1.75E-01	—	—	—	—	—	—	—	—	—
RDX	—	—	—	—	—	—	—	1.47E-01	3.49E-01	—	—
Thallium	—	—	—	—	—	—	—	—	—	—	—
TPH-Diesel	—	—	—	—	—	—	—	—	—	—	—
Cs-137	—	—	—	—	—	—	—	—	—	—	—
Ra-226	—	—	—	—	—	—	—	—	—	—	—
U-235	—	—	—	—	—	—	—	—	—	—	—
U-238	—	—	—	—	—	—	—	—	—	—	—

Table E2-34. (continued).

COPCs	NODA			
	Area 2	Area 3	Area 4	CFA-633
2,4,6-Trinitrotoluene	6.55E+00	—	—	8.03E-01
2-Amino-4,6-Dinitrotoluene	—	—	—	—
2-Pentanone	6.38E+00	6.08E+00	—	—
4-Amino-2,6-Dinitrotoluene	—	—	—	—
4-Chloro-3-methylphenol	1.92E-01	—	—	—
Antimony	1.13E+00	—	—	—
Arsenic	—	—	—	—
Benzene	—	—	—	—
Benzo(a)pyrene	—	—	4.40E-01	—
Benzo(g,h,i)perylene	1.91E-01	—	—	—
Cadmium	—	4.01E+00	—	—
Chrysene	—	—	—	—
Copper	1.65E+02	—	—	—
Lead	2.63E+01	—	—	—
Methapyrilene	—	—	5.28E-01	—
Phenanthrene	—	—	2.47E-01	—
RDX	3.28E+02	—	—	2.37E+00
Thallium	8.59E-01	8.24E-01	—	—
TPH-Diesel	—	—	5.09E+02	—
Cs-137	—	—	—	—
Ra-226	—	—	—	—
U-235	—	—	—	—
U-238	—	—	—	—

Table E2-35. Site/area dimensions for the current worker scenario.

	Max Depth (ft)	Area of Site/ Group (ft ²)	Width of Site (ft)
BORAX-01	8	7.19E+04	5.94E+01
BORAX-02	1	9.97E+03	1.21E+02
BORAX-08	3	3.12E+04	6.58E+01
BORAX-09	0.5	3.47E+03	4.14E+01
EBR-08	18	9.49E+01	9.77E+00
EBR-10	12	9.69E+01	1.07E+01
LCCDA-01	14	1.19E+02	1.22E+01
LCCDA-02	14	1.29E+02	1.36E+01
OMRE	10	5.43E+03	9.04E+01
Burnring	2	1.44E+02	1.20E+01
Firestation Area 1	2	3.83E+05	7.50E+02
Firestation Area 2	2	1.59E+05	4.29E+02
Firestation Area 3	2	2.79E+02	3.10E+01
Firestation Area 4	2	2.28E+03	6.50E+01
Fieldstation Area 1	0.5	2.11E+03	3.70E+01
Mine Fuze Area 2	2	2.12E+06	1.00E+03
Mine Fuze Area 3	2	1.37E+02	1.03E+01
NOAA Area 2	2	8.05E+05	9.11E+02
NOAA Area 2a	0.33	4.16E+04	2.00E+02
NOAA Area 3	2	2.07E+05	7.46E+02
NOAA Area 5	2	1.80E+04	1.70E+02
NOAA Area 6	2	1.43E+04	1.24E+02
NODA Area 2	10	2.22E+06	1.57E+03
NODA Area 3	8	8.72E+06	2.94E+03
NODA Area 4	2	1.00E+04	1.00E+02
CFA-633	0.33	6.41E+04	2.98E+02
Totals	—	—	—
Group A	—	1.16E+05	2.87E+02
Group B	—	1.92E+02	2.05E+01
Group C	—	2.47E+02	2.58E+01
Group D	—	5.45E+05	1.28E+03
Group E	—	2.12E+06	1.01E+03
Group F	—	1.09E+06	2.15E+03
Group G	—	1.09E+07	4.61E+03

A Grouping/Cumulative Methodology will be used in the calculations of the following exposure pathways: Groundwater Ingestion, Inhalation of Fugitive Dust, Inhalation of Volatiles from Soil, Inhalation of Volatiles from Groundwater, External Radiation Exposure, and Dermal Absorption of Groundwater.

Group A consists of the following sites: Borax-01, Borax-02, Borax-08 and Borax-09.

Group B consists of the following sites: EBR-08 and EBR-10.

Group C consists of the following sites: LCCDA-01 and LCCDA-02.

Group D consists of the following sites: Firestation Areas 1 through 4

Group E consists of the following site: Mine Fuze Areas 2 and 3

Group F consists of the following sites: NOAA Areas 2, 2a, 3, 5 and 6

Group G consists of the following sites: NODA Areas 2 through 4

Burnring, Fieldstation, CFA-633, and OMRE will be considered as individual sites and will not be calculated using the grouping/cumulative methodology.

The maximum depth of contamination that was found during the various sampling activities is used in the Max Depth column. Used nonvalidated data if that was the deepest detected contamination.

Table E2-36. 0–0.5 feet, average radioactive decayed exposure point concentrations by site, year 0 to 25 (pCi/g) for the current worker scenario.

COPCs	BORAX-01	BORAX-02	BORAX-08	BORAX-09	EBR-08	EBR-10	LCCDA-01	LCCDA-02	OMRE	Burnring	Firestation		
											Area 1	Area 2	Area 3
Cs-137	1.70E+00	3.18E+00	5.50E+00	1.10E+00	—	—	3.80E+00	—	2.76E+01	—	—	—	—
Ra-226	—	—	—	—	—	—	6.95E+00	2.19E+00	—	—	—	—	—
U-235	2.50E-01	2.40E-01	—	—	—	—	1.25E-01	—	6.69E-02	—	—	—	—
U-238	1.21E+00	—	—	—	—	—	5.10E+00	—	—	—	—	—	—

Notes: A blank cell indicates that the COPC was not a chemical of concern at this site.

Used for Soil Ingestion & Inhalation FGD.

Table E2-36. (continued).

COPCs	Firestation	Fieldstation	Mine Fuze				NOAA				NODA			CFA-633
	Area 4	Area 1	Area 2	Area 3	Area 2	Area 2a	Area 3	Area 5	Area 6	Area 2	Area 3	Area 4	Area 4	
Cs-137	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Ra-226	—	—	—	—	—	—	—	—	—	—	—	—	—	—
U-235	—	—	—	—	—	—	—	—	—	—	—	—	—	—
U-238	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Table E2-37. 0–4 feet, rad decayed exposure point concentrations by site, year 0 to 25 (pCi/g) for the current worker scenario.

COPCs	BORAX-01	BORAX-02	BORAX-08	BORAX-09	EBR-08	EBR-10	LCCDA-01	LCCDA-02	OMRE	Burnring	Firestation		
											Area 1	Area 2	Area 3
Cs-137	7.26E+01	1.69E+00	1.03E+01	1.38E-01	—	—	6.60E+00	—	9.28E+00	—	—	—	—
Ra-226	—	—	—	—	—	—	8.69E-01	2.74E-01	—	—	—	—	—
U-235	3.13E-01	2.31E-01	—	—	—	—	2.25E-01	—	6.34E-02	—	—	—	—
U-238	1.38E+00	—	—	—	—	—	5.48E+00	—	—	—	—	—	—

Notes: A blank cell indicates that the COPC was not a chemical of concern at this site.

Used for Soil Ingestion & Inhalation FGD.

Table E2-37. (continued).

COPCs	Firestation	Fieldstation	Mine Fuze			NOAA			NODA			CFA-633
	Area 4	Area 1	Area 2	Area 3	Area 2	Area 2a	Area 3	Area 5	Area 6	Area 2	Area 3	Area 4
Cs-137	—	—	—	—	—	—	—	—	—	—	—	—
Ra-226	—	—	—	—	—	—	—	—	—	—	—	—
U-235	—	—	—	—	—	—	—	—	—	—	—	—
U-238	—	—	—	—	—	—	—	—	—	—	—	—

Table E2-38. 0–0.5 feet, area weighted average of exposure point concentrations (mg/kg or pCi/g) for the current worker scenario.

COPCs	BORAX	EBR	LCCDA	OMRE	Firestation	Mine Fuze	NOAA	NODA
2,4,6-Trinitrotoluene	—	—	—	—	4.79E+01	4.46E+00	1.47E+02	6.18E+01
2-Amino-4,6-Dinitrotoluene	—	—	—	—	—	—	—	—
2-Pentanone	—	—	—	—	—	—	—	4.90E+01
4-Amino-2,6-Dinitrotoluene	—	—	—	—	—	—	—	—
4-Chloro-3-methylphenol	—	—	—	—	—	—	—	4.06E-02
Antimony	—	—	—	—	—	—	—	7.57E-01
Arsenic	—	—	—	—	—	—	—	—
Benzene	—	—	—	—	—	—	—	—
Benzo(a)pyrene	—	—	—	1.66E-01	8.97E-05	—	—	9.13E-04
Benzo(g,h,i)perylene	—	—	—	—	—	—	—	3.84E-02
Cadmium	—	—	—	—	—	—	—	2.24E+01
Chrysene	—	—	—	2.55E+03	—	—	—	—
Copper	—	—	—	—	—	—	—	4.14E+01
Lead	—	—	—	—	—	—	—	5.38E+00
Methapyrilene	—	—	—	—	—	—	—	1.55E-03
Phenanthrene	—	—	—	—	8.97E-05	—	—	3.01E-04
RDX	—	—	—	—	—	—	3.83E-01	6.66E+01
Thallium	—	—	—	—	—	—	—	6.17E+00
TPH-Diesel	—	4.23E+00	—	1.83E+00	2.76E+01	—	—	1.10E+00
Cs-137	—	—	—	—	—	—	—	—
Ra-226	—	—	—	4.47E+00	—	—	—	—
U-235	—	8.09E-02	—	6.00E-02	6.69E-02	—	—	—
U-238	—	1.68E-01	—	2.45E+00	—	—	—	—

Notes: A blank cell indicates that the COPC was not a chemical of concern at this site.
Also used for airborne particulate area weighted average.

Table E2-39. 0–4 feet, area weighted average of exposure point concentrations (mg/kg or pCi/g) for the current worker scenario.

COPCs	BORAX	EBR	LCCDA	OMRE	Firestation	Mine Fuze	NOAA	NODA
2,4,6-Trinitrotoluene	—	—	—	—	6.54E+00	6.47E-01	4.72E+01	1.33E+00
2-Amino-4,6-Dinitrotoluene	—	—	—	—	—	—	—	—
2-Pentanone	—	—	—	—	—	—	—	6.13E+00
4-Amino-2,6-Dinitrotoluene	—	—	—	—	—	—	—	—
4-Chloro-3-methylphenol	—	—	—	—	—	—	—	3.90E-02
Antimony	—	—	—	—	—	—	—	2.29E-01
Arsenic	—	—	—	—	—	—	—	—
Benzene	—	—	—	—	—	—	—	—
Benzo(a)pyrene	—	—	—	1.66E-01	8.97E-05	—	—	4.02E-04
Benzo(g,h,i)perylene	—	—	—	—	—	—	—	3.87E-02
Cadmium	—	—	—	—	—	—	—	3.19E+00
Chrysene	—	—	—	3.19E+02	—	—	—	—
Copper	—	—	—	—	—	—	—	3.36E+01
Lead	—	—	—	—	—	—	—	5.33E+00
Methapyrilene	—	—	—	—	—	—	—	4.82E-04
Phenanthrene	—	—	—	—	8.97E-05	—	—	2.25E-04
RDX	—	—	—	—	—	—	7.20E-02	6.66E+01
Thallium	—	—	—	—	—	—	—	8.31E-01
TPH-Diesel	—	1.97E+04	—	—	—	—	—	4.65E-01
Cs-137	1.66E+01	—	3.17E+00	9.28E+00	—	—	—	—
Ra-226	—	—	5.59E-01	—	—	—	—	—
U-235	—	—	1.08E-01	6.34E-02	—	—	—	—
U-238	1.91E-01	—	2.63E+00	—	—	—	—	—

Notes: A blank cell indicates that the COPC was not a chemical of concern at this site.

Also used for airborne particulate area weighted average.

Table E2-40. Exposure parameters for the current worker scenario.

Exposure Parameter	Variable Name	Current and Future Occupational Worker	Variable Name	Future Residential, Adult	Variable Name	Future Residential, Child	Reference
Adherence Factor, Soil-to-Skin (mg/cm ²)	AFw	0.07	AFa	0.2	—	—	1
Averaging Time, Carcinogenic (day)	—	—	ATac	24500 ^a	—	—	2
Averaging Time, Noncarcinogenic (day)	ATwn	8750	ATan	10500	—	—	2
Body Weight (kg)	—	—	BWa	70	BWc	15	2
Exposure Duration (yr)	EDw	25	EDa	30	—	—	2
Exposure Duration for Soil Ingestion (yr)	EDw	25	EDas	24	EDcs	6	2
Exposure Frequency, (days/yr)	EFw	250	EFa	350	—	—	2
Exposure Time (hrs/day)	ETw	8	ETA	24	—	—	3
Exposure Time to Groundwater for Bathing (hrs/day)	—	—	ETWa	0.25	—	—	3
Fraction Ingested	—	—	FI	1	—	—	3
Gastrointestinal Absorption Efficiency (dim)	—	—	GI	0.05 ^b	—	—	3
Intake Rate, Inhalation (m ³ /hr)	—	—	IRI	0.83	—	—	2
Intake Rate, Produce Ingestion, Radionuclides, (g/day)	—	—	IRPar	1.67E+01	—	—	5
Intake Rate, Produce Ingestion, NonRads, (g/kg-day)	—	—	IRPan	2.76E-01	—	—	5
Intake Rate, Soil Ingestion (mg/day)	IRSw	50	IRSa	100	IRSc	200	2
Intake Rate, Water Ingestion (L/day)	—	—	IRWa	2	—	—	2
Respirable Airborne Particulate Matter Concentration (mg/m ³)	—	—	Resp	0.013	—	—	4
Skin Surface Area Available for Soil Contact (cm ² /event)	SAws	3300	SAas	5700	SAcS	2800	1
Skin Surface Area Available for Water Contact (cm ² /event)	—	—	SAaw	20000	—	—	1
Site-specific wind speed in mixing zone (m/s)	V	3.4	—	—	—	—	2
Mixing Height (m)	MH	2	—	—	—	—	2

Table E2-40. (continued).

Exposure Interval (s)	Tw	7.88E+08	Ta	9.46E+08	—	—	2
Soil Porosity (dimensionless)	E	0.35	—	—	—	—	2
True Soil Density (g/cm ³)	RHO	1.5	—	—	—	—	2

a. The averaging time is based on a 350 d/year exposure period.

b. The GI was defaulted to 0.05 based on guidance in Appendix A of EPA (1989). This guidance states that a relatively conservative assumption for oral absorption in the absence of appropriate information would be 5 percent. Currently, Region 9 for their route-to-route extrapolation methods discusses the use of oral toxicity values for evaluating dermal exposures (EPA 1999b). They state that for many chemicals, a scientifically defensible database does not exist for making this conservative an adjustment of the oral slope factor/RfD to estimate a dermal toxicity value. Region 9 uses the current guidance (USEPA 1999a), recommends that cadmium is the only contaminant requiring an adjustment factor. The 1999 Region 9 PRG calculations for cadmium are based on this adjustment. This risk assessment continued to conservatively apply the 5 percent adjustment.

Sources:

1. Environmental Protection Agency Region 9, Preliminary Remediation Goals, November 9, 1999, <http://www.epa.gov/region9/waste/sfund/prg/intro.html>.
2. DOE-ID, January 1994, Track 2 Sites: Guidance for Assessing Low Probability Hazard Sites at the INEL, DOE/ID-10389, Rev. 6, U.S. Department of Energy Idaho Operations Office.
3. DOE-ID, January 1999a, Waste Area Group 5, Operable Unit 5-12, Comprehensive Investigation/Feasibility Study, DOE/ID-10607, U.S. Department of Energy Idaho Operations Office
4. DOE-ID, 1992, Site Environmental Report, DOE/ID-12082, U.S. Department of Energy Idaho Operations Office. (Grand mean particulate matter concentration)
5. LMITCO, 1996, INEEL White Paper on the Food Crop Ingestion Exposure Route, Lockheed Martin Idaho Technologies.
6. U.S. EPA. 1999b. *Risk Assessment Guidance for Superfund Volume I: Human Health Evaluation Manual Supplemental Guidance Dermal Risk Assessment, Interim Guidance*. EPA/540/R-99/005. Office of Solid Waste and Emergency Response, Washington, D.C. PB99-963312.